The New Mexico Supercomputing Challenge

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Since 1990, the New Mexico Supercomputing Challenge (the Challenge) has been inspiring students from around New Mexico to pursue their interests in science, technology, engineering, and mathematics. The Challenge is a school-year long, project-based competition/learning experience where teams of one to five students select a computational science project and work on it from September through April.

The vision of the Supercomputing Challenge is to be a nationally recognized program that promotes computational thinking in science and engineering so that the next generation of high school graduates is better prepared to compete in an information-based economy.

Fig. 1. Logo winner for 2008-2009 done by one of the competing teams.

The mission of the Supercomputing Challenge is to teach teams of middle and high schools students how to use powerful computers to analyze, model, and solve real-world problems.

A gratifying consequence of being held for 19 years is seeing former participants returning as mentors and judges for current participants. Many former participants have sought employment at LANL, SNL, and other high tech companies. Several students have thought that the Challenge is so worthy that they start "giving back" while they are in college.

Younger students are encouraged to learn about simulation and modeling by using languages like StarLogo The Next Generation and Netlogo, while more advanced students use high-level programming languages like C, C++, Fortran, and Java. A few teams use the Message Passing Interface to perform parallel processing.

Many LANL employees volunteer as instructors at the fall kickoff conference and as project mentors during the year. Approximately 100 LANL employees are involved in the year-end Project Exposition, which includes the judging of the projects, tours of the Laboratory, talks about current research, and an Awards Ceremony.

The Challenge has partnered with a new NSF program called GUTS (Growing Up Thinking Scientifically), which targets middle school students with after-school clubs to do place-based projects in modeling (see http://projectguts.org). GUTS is a feeder program into the Challenge. In July of 2008, the Challenge and GUTS cosponsored a Summer Teacher Institute (STI) that trained 34 teachers to be better coordinators and team sponsors. The 2-week STI was held at New Mexico Tech in Socorro, and the teachers received three units of graduate credit from NM Tech. The New Mexico Public Education Department provided much of the funding for the STI.

The Challenge is partnering with the New Mexico Computing Applications Center to be its educational outreach arm, taking advantage of the gateway sites that will be deployed around the state.

Fig. 2. Tony Huang and Erika DeBenedictis, are all smiles after capturing the top prize during the 2008 New Mexico Supercomputing Challenge hosted by the Laboratory.

Fig. 3. Group picture of all the finalists and their team sponsors.

The Challenge has partnered with New Mexico Innovative Digital Education and Learning (IDEAL) to offer an on-line Advanced Placement Computer Science course.
More information about the Challenge can be found on the web page at: http://www.challenge.nm.org. Past final reports are available; see the Challenge archives on the web site.

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- SNL
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For a full list of sponsors see http://www.challenge.nm.org/sponsors.shtml.